



# Physical development of child



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- Dynamic process of growth—the increase of body length and mass and biological maturation of the child in different period of life

# Formulas for approximate determination of the fetus length and body mass

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- The length of the fetus body during first 5 month is equal month of pregnancy in second degree
- after 5 month the length is equal the number of month gestation  $\times 5$
- In the term of gestation 25-42 weeks the body mass at 30 weeks-1300g, for every next week-+200g, before 30 week— -100g

# At birth

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- for full-term newborn

Weight 3.350- girls, 3500- boys

Physiological loss body weight up to 6-8%  
from 3-th day to 7-th – 8-th

The length of the body of newborn 50 cm  
(46-56 cm)

The head circumference – 34 -36 cm

The chest circumference is 32 -34 cm

# Ideal body weight of the child in the first years

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- Every month during the first half – year of life the weight increase by 800 g and during the second – by 400 g

# Ideal body weight of the child

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- After the breast Feeding period up till 10 years of age

10,5 kg (average body weight of 1years old child + 2 kg x n

N- age of the child

After 10 years the body weight increases by 4 kg annually

# Ideal growth of children

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- The first quarter (3 months)-by 3 cm
- The second quarter -2,5 cm

Till 4 years the BL increases by 8 cm annually

4 yr- 100cm

After 4 yr of age the body length increases by 6 cm annually

# Chest circumference

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First 6 months –by 2 cm monthly

Second half-year – by 0,5 cm monthly

Till 5 years – by 1,5 cm annually

Till 15 years – 3 cm annually



# Index of Arisman and Chulitskaya

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Chest circumference –  $\frac{1}{2}$  body length

Normative values

The breast –feeding age – 13,5 – 10 cm

2-3 years – 9-6 cm

6-7 years – 4-2 cm

7-8 years – 0 cm

Till 15 years – 1-3 cm

# Index of Chulitskaya

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- 3 circumference of upper arm +1 circumference of thigh +1 circumference of calf = Length of body
- for children of breast-feeding period – normative value – 20 -25 cm

# indexs of proportionality

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- The index of proportionality Length of leg (cm)  
body length of body x100  
(I.Vorontsov)

Ratio of body length / height in sitting position to body  
length / height in standing position x 100

newborn -70 %

3 years – 57 %

Girl of 12 years and boys of 15 years – 52 %

# Main criteria or assessing the physical development by graphs (WHO)

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- Weight - by - age
- Length / height-by – age
- Weight –by – length / height
- Body mass index
- Head circumference

# Hypotrophy

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Reduction on actual body weight in comparison  
with ideal body weight

According to the WHO

- Protein – energy deficiency the most frequent  
etioloical factor and type of hypotrophy

# Hypotrophy

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- Primary - exogenous origin ( alimentary factor, psychogenic factors))
- Secondary – endogenous ( anomalies of digestive tract, malabsorption syndrome, infection diseases, immunodeficiency, central nervous system diseases

# Hypotrophy

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- 1-th degree – deficiency in BW=11 – 20%
- 2-th degree – deficiency in BW=21-30%
- 3-th degree – deficiency in BW=31% and more

The main sing hypotrophy - decreased thickness of subcutaneous tissue

Only on the trunk-Id

On the limbs – II d

On face- III d **Fase of Voltaire**

Decreased turgor and elasticity of child skin

Significant slowing of neuropsychological development

# Hypostature

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- Identical lag of growth and body weight in children of the first year of life in comparison with average normative parameters for corresponding age
- BL –less by 5-10 cm
- Actual BW less than average BW it corresponds to the growth of the child



# paratrophy

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- Increase of BW in comparison with normal data by 10 % and more

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- Irrational feeding of the child
  - Constitutional propensity
  - Metabolic infringements (faster raised hydrolability)
  - functional infringements hypothalamic nucleus lead to a disbalance between the senses of appetite and satiety

# Two type of paratrophny

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- Lipomatotic type
- Lipomatoso-edematic

Pallor and edema of skin, pallor of mucos membrain, anemia. Skin flabby, child is languid, dull

Very often atopic dermatites,rickets, reduced immunological status, very often respiratory diseases with complications such as obstructive syndrom